IN THE CLAIMS

1 - 10. (canceled)

11. (currently amended) A swath band pass filter for use in a radar signal processing circuit, said filter comprising a first order filter, said filter configured to center on a doppler frequency and operate according to $Eo = (A0/B0) \times En - (A0/B0) \times En \times Z^{-2} - (B1/B0) \times Eo \times Z^{-1} - (B2/B0) \times Eo \times Z^{-2}$, where En is an input signal, A0 is $2 \times Fs \times Wb$, B0 is $(4 \times Fs^2) + (2 \times Fs \times Wb) + (Wl \times Wu)$, B1 is $(2 \times Wl \times Wu) - (8 \times Fs^2)$, and $B2 = (4 \times Fs^2) - (2 \times Fs \times Wb) + (Wl \times Wu)$, and $Wb = 2\pi B$, a bandwidth in radians, $Wu = 2\pi \times (Fc + B/2)$, an upper 3db point of said filter in radians, and $Wl = 2\pi \times (Fc - B/2)$, a lower 3db point of said filter in radians.

12. (original) A radar signal processing circuit comprising:

a radar gate correlation circuit configured sample radar data at a sampling rate;

a correlation bass pass filter configured to filter non-zero gated radar return samples and ignore zero amplitude samples;

a mixer configured to down sample an in-phase component and a quadrature component of the filtered signal to a doppler frequency;

a band pass filter centered on the doppler frequency; and

a processor configured to determine a center frequency for said band pass filter.

13. (original) A radar signal processing circuit according to Claim 12 wherein said band pass filter is configured to operate according to $Eo = (A0/B0) \times En - (A0/B0) \times En \times Z^{-2} - (B1/B0) \times Eo \times Z^{-1} - (B2/B0) \times Eo \times Z^{-2}$, where En is an input signal, A0 is $2 \times Fs \times Wb$, B0 is $(4 \times Fs^2) + (2 \times Fs \times Wb) + (Wl \times Wu)$, B1 is $(2 \times Wl \times Wu) - (8 \times Fs^2)$, and $B2 = (4 \times Fs^2) - (2 \times Fs \times Wb) + (Wl \times Wu)$, and $Wb = 2\pi B$, a bandwidth in radians, $Wu = 2\pi \times (Fc + B/2)$, an upper

3db point of said filter in radians, $Wl = 2\pi \times (Fc - B/2)$, a lower 3db point of said filter in radians, Fs is a sampling frequency and Fc is a determined center frequency for said band pass filter.

14. (original) A radar signal processing circuit according to Claim 12 wherein said processor is configured to:

receive an antenna mounting angle, a slant range, and velocity vectors in body coordinates using the antenna mounting angle, slant range, and velocity vectors;

calculate a range swath doppler velocity, and a track and phase swath bandwidth;

calculate a phase swath doppler velocity based at least in part on the range swath doppler velocity and the track and phase swath bandwidth;

calculate a range swath center frequency based on the range swath doppler velocity;

calculate a phase swath center frequency based on the phase swath doppler velocity; and

calculate a level and verify swath bandwidth based upon the track and phase swath bandwidth.

15. (original) A radar signal processing circuit according to Claim 14 wherein said processor is configured to determine a doppler velocity, Vr at a range swath center frequency according to $Vr = Vv \times Cos(90-r-a) = Vv \times Sin(a + r)$, where $Vv = (Vx^2 + Vz^2)^{0.5}$, where Vx = velocity component on body x axis and Vz = velocity component on body z axis, $a = ATan(Vz / Vx)$, and r is the antenna mounting angle.

16. (original) A radar signal processing circuit according to Claim 15 wherein said processor is configured to determine a range swath center frequency, Fr, according to $Fr = 2 \times Vr / L$, where L is a wavelength of the radar.

17. (original) A radar signal processing circuit according to Claim 14 wherein said processor is configured to calculate a phase swath doppler velocity, Vp, according to $Vp = Vv \times Cos(90-(r-p)-a) = Vv \times Sin(a + r - p)$, where $Vv = (Vx^2 + Vz^2)^{0.5}$, where Vx = velocity component on body x axis and Vz = velocity component on body z axis, a = ATan(Vz / Vx), r is the antenna mounting angle, and $p = (T \times Vx / H) \times (180 / \pi)$ in degrees, where $T = 1 / \pi B$ and is a delay through range swath filter, $T \times Vx$ is vehicle movement on body X axis, B is the swath bandwidth, and H is altitude in feet.

18. (original) A radar signal processing circuit according to Claim 17 wherein said processor is configured to determining a phase swath center frequency, Fp, according to $Fp = 2 \times Vp / L$, where L is a wavelength of the radar.

19. (original) A radar signal processing circuit according to Claim 14 wherein said processor is configured to calculate track and phase swath bandwidth, B, according to $B = Vx / (0.6(H)^{0.5})$ in hertz, where Vx = velocity component on body x axis and H is altitude in feet.

20. (original) A radar signal processing circuit according to Claim 19 wherein said processor is configured to calculate level and verify swath bandwidth as a ratio of level and verify bandwidths to track and phase bandwidths, K, multiplied by track and phase swath bandwidth, B.

21. (currently amended) A method for centering a doppler swath within an antenna beam utilizing a radar signal processing circuit including a processor, said method comprising:

controlling a swath filter center frequency with the processor based on aircraft velocity; and

controlling swath filter bandwidth with the processor based on aircraft velocity such that a charge time for the filter is equal to the time that the aircraft takes to fly across the doppler swath.

22. (currently amended) A method according to Claim 21 wherein an antenna mounting angle, a pitch of the aircraft, and an angle to a center of the antenna beam are known, and the swath filter center frequency, Fc, is calculated with the processor according to $Fc = 2 \times \text{Velocity} \times \sin(\text{angle}) / \text{radar wavelength}$.

23. (currently amended) A method according to Claim 22 wherein controlling swath filter bandwidth comprises setting a bandwidth, B, with the processor according to $B = \text{Velocity} / (0.6(H)^{0.5})$ in hertz, where H is altitude in feet.